Stages of a Mine

A guide to understand 80% of buzzwords

Phase: Stage Name

Selected Activities: Geo-surveying · Drilling · Getting Approvals · Analyzing

Qualified Person Heavily Involved: Qualified Person

FINDING A DEPOSIT

Prospector

Grassroots-Explorer

Find a place that could host metals.
(non-intrusive)

GRASSROOTS EXPLORATION:

Samples & Surveys

Find rocks without disturbing the ground (non-intrusive)

GEO-SURVEYS:

Geophysics

"doing and X-Ray / MRI of the area"

- LIDAR (3D-ground-model)
- Magnetic
- Seismic
- Electric & Electromatnetic
- Radiometric

geo-surveying

Geochemistry

"take a blood sample of the area"

- Soil & Sediment
- Rock Chips
- Water
- Plants & trees

geo-surveying

PROSPECTORS LICENSE / CLAIMS STAKING

getting approvals

Permitting

getting approvals

TESTING THE DEPOSIT

Explorer

Test if there really could be something worthwhile.
(intrusive)

EARLY EXPLORATION

First tests in the ground (intrusion starts). Shallow holes, small trenches, bigger samples
Goal: see if the first signs are real or just a "false alarm."

drilling

ADVANCED EXPLORATION

Serious testing of the deposit. Bulk samling (tonnes of rock!), metallurgy tests
Goal: build enough knowledge to estimate size and value of the deposit.

drilling

Permitting

getting approvals

DEFINING & MODELING THE RESOURCE

Explorer

Making sure there probably is enough in the ground.

RESOURCE DEFINITION

Drill more holes to better understand the shape of the deposit. This gives the data for Resource classification.

drilling

RESOURCE CLASSIFICATION

Use data from drilling. Depending on level of confidence, they´re assigned their respective category.

analyzing · QP

ADDITIONAL (TECHNICAL) STUDIES

Conduct all studies needed for the "Modifying Factors" to test the economics.

geo-surveying · analyzing · QP

MINERAL RESOURCES

What´s in there?

Increasing level of geological knowledge and confidence

LOW — REASONABLE — HIGH

Inferred · Indicated · Measured

THE "MODIFYING FACTORS"

- mining
- processing
- metallurgy
- economic
- marketing
- legal
- environmental
- infrastructure
- social
- government

Resource + Economical Evaluation through PFS / FS (application of Modifying Factors to Resource) = Reserve

Probable · Proven

MINERAL RESERVES

Can you get it out and is it profitable?

Graphic adapted from: CIM (Canadian Institute of Mining, Metallurgy and Petroleum) Definition Standards for Mineral Resources & Mineral Reserves.
Similar for JORC Code | Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy)

TESTING ECONOMICS

Developer

Making sure you can extract it for more than it costs.

PRELIMINARY ECONOMIC ASSESSMENT (PEA)

Rough math if it makes sense to conduct a more detailed study.

analyzing · QP

PRE-FEASIBILITY STUDY (PFS)

Pretty detailed plan of the deposit and it´s economical influence factors.

analyzing · QP

FEASIBILITY STUDY (FS)

Very detailed plan incorporating all kind of detailed studies. Called bankable if sufficient for financiers.

analyzing · QP

allow you to move a Resource to a Reserve

DEVELOP-MENT

Developer

Making more detailed plans and actually building the mine facilities etc.

PREPARING FOR DEVELOPMENT

Final Engineering Studies. Financings, Offtake-Agreements, Permits, ...

DESIGN

Detailed mine plan, Plant layout, Tailings & water management, Closure plan design

CONSTRUCTION

Building everything ready for production

Permits and Approvals

getting approvals

OPERATION

Operator · Producer

Mining something and FINALLY SELLING sth. Revenues and CASH- FLOW phase.

PRODUCTION MINING

Get the ore out of the ground

PROCESSING

Separating the ore into the product and waste

SELLING / MARKETING

Selling and delivering the product

CLOSURE & RECLAMATION

Operator · Producer

DECOMMISSIONING

Shutting down the mine

RECLAMATION

Healing the land

MONITORING

Keeping an eye on the site after closure

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